

## New UConn Faculty Members in Sustainable Energy



**1. Dr. Prabhakar Singh** has been selected Director of the Connecticut Global Fuel Cell Center at the University of Connecticut following an international search. His faculty appointment as the UTC Chair Professor of Fuel Cell Technology will be in the Department of Chemical, Materials & Biomolecular Engineering. Dr. Singh is currently with the Pacific Northwest National Laboratory (PNNL) where he oversees and directs the advanced solid oxide fuel cell (SOFC) development activities of the NETL-PNNL led U.S. Department of Energy's SECA Core Technology Program and interfaces with government and industrial clients working in the fuel cell product development. Dr. Singh will begin his duties officially on January 1, 2009.

As Director, Dr. Singh will guide the Center's research and educational activities while also overseeing operations. He will have responsibility for attracting resources and engendering strong collaborative partnerships between the CGFCC and industrial and government partners. He will serve as a catalyst for team-based visionary research and development in the area of fuel cell technology and application. He is widely recognized for his technical contributions relating to the identification, characterization, and development of mechanistic understanding of accelerated corrosion of metals and alloys under bi-polar exposure conditions as encountered in advanced fuel cell electrochemical power generation systems.

Prior to joining PNNL, Dr. Singh held several key technical and management positions at Ford Motor Company, Westinghouse Electric Corporation and FuelCell Energy. While at Ford Motor Company's Visteon Corporation enterprise, Dr. Singh managed PEM fuel cell research and development, including fuel cell system and advanced "on board" fuel processing technologies development. At Westinghouse Electric Corporation, as technical group leader and a member of the technical staff, Dr. Singh developed SOFC cell and stack component materials, large scale manufacturing processes, hydrocarbon processing and "on anode" reforming. At FuelCell Energy, Dr. Singh led the development work on corrosion tolerant materials, creep tolerant electrodes and process scale up.

Dr. Singh earned his Ph.D. in metallurgy at the University of Sheffield, England and an MBA degree from the University of Pittsburgh. He holds more than 50 U.S. patents and trade secrets, and he has authored or co-authored more than 100 technical reports and papers along with three book chapters. He is a Fellow of ASM International, the American Ceramic Society and the National Association of Corrosion Engineers, and he serves as Chairman of the ASM Energy Committee.



**2. Dr. Hanchen Huang** has accepted the UConn School of Engineering Professorship in Sustainable Energy. Dr. Huang is currently a professor in the Department of Mechanical, Aerospace & Nuclear Engineering at Rensselaer Polytechnic Institute, Troy, NY. He will join UConn as a faculty member in the Department of Mechanical Engineering in August 2009.

Dr. Huang's position is associated with the Eminent Faculty Initiative in Sustainable Energy, an initiative funded by a State of Connecticut allocation of over \$2.8 million annually, with additional support of \$5.5 million from UTC Power, FuelCell Energy,

Northeast Utilities and the Clean Energy Fund/Connecticut Innovations. The goal of this program is to hire 10 to 12 faculty members to form the core of an interdisciplinary, integrated team working in the strategic areas of sustainable energy with emphasis on fuel cells, energy conversion and storage, alternative energy and fuels, power and energy harvesting.

Prior to joining RPI in 2002, Dr. Huang served as a faculty member in the Department of Mechanical Engineering at Hong Kong Polytechnic University (HKPU). Professor Huang also conducted research in advanced materials and nano-mechanics at the U.S. Department of Energy (DoE) facilities in Lawrence Livermore National Laboratory from 1995 to 1998.

Dr. Huang earned his M.S. in theoretical physics at the Institute of Atomic Energy of the Chinese Academy of Sciences, and his Ph.D. in nuclear engineering at UCLA. His research efforts - funded by DoE, the National Science Foundation, the Army Research Laboratory, Hong Kong RGC, national labs and industry consortia - involve nanomaterials for energy storage, atomistic simulation methods, semiconductors, materials processing, interfacial phenomena and nuclear fusion. Dr. Huang has nearly 100 refereed journal publications and more than 1,000 SCI citations based on his work.

Dr. Huang's research involves surface/interface processing at the atomistic level that has tremendous potential to advance materials required for fuel cells, solar cells and catalyst development. In the area of nanofabrication, his efforts focusing on nanowires and nanorods aim to reveal atomistic mechanisms of growth, including both kinetic and thermodynamic factors. These materials can play a major role in developing supercapacitors for energy storage. His research involving the mechanics of nanowires, nanotubes and nanoplates seeks to reveal anomalies with respect to continuum mechanics, including both elastic deformation and structural changes.

He has received several awards, including the 2007 RPI School of Engineering Excellence in Research Award, the 2002 President's Award for Outstanding Performance in Research and Scholarship (HPKU), the 2001 Bole Award for Professional Leadership (Chinese Mechanical Engineering Society) and the 1992 Scientific Progress Award (China Department of Energy).



**3. Dr. George A. Rossetti, Jr.**, associate professor of the Chemical, Materials & Biomolecular Engineering department, brings expertise in structure-processing-property relations in electroceramic materials and their applications in dielectric, electromechanical and energy conversion devices and systems. His experience spans more than a decade in industry and he was also a Senior Research Scientist at the NASA Center for Advanced Microgravity Materials Processing at Northeastern University, Boston. His current work embodies both theoretical and experimental activities focused on high-temperature chemistry and processing of complex perovskite-structured oxides with applications as electrodes in solid oxide fuel cell systems, thermodielectric power converters and cooling devices, electromechanical transducers for energy harvesting, high energy density capacitors for electrical energy storage, and sensors and actuators for energy conversion systems. Dr. Rossetti earned his M.S. in materials engineering from Worcester Polytechnic Institute and his Ph.D. in solid state science from The Pennsylvania State University. He conducted post-doctoral work at the Princeton Materials Institute.



**4. Dr. Brian G. Willis** is an associate professor of the Chemical, Materials & Biomolecular Engineering department. Dr. Willis maintains a vigorous research program in nanotechnology with applications in semiconductor devices and fuel cells, molecular electronics, and biochemical sensors. His research, which merges integrated circuit technology with molecular devices, has received significant support from the National Science Foundation, the U.S. Department of Energy and the Department of Defense. Dr. Willis is the recipient of an NSF CAREER Award and, from the University of Delaware, an Emmert Faculty Fellowship and the Dow Corning Award. He earned his Ph.D. in chemical engineering from MIT in 1999.



**5. Dr. William Mustain** is an assistant professor in the Chemical, Materials & Biomolecular Engineering department. Dr. Mustain's research interests include the development of new materials for proton exchange membrane fuel cells, the development of a room temperature molten carbonate fuel cell, aerobic biocathodes for oxygen reduction reaction, microfabricated biological fuel cells and fundamental studies on both electrochemical kinetics and ionic transport in solid electrolytes. Dr. Mustain's research centered on the design of a platinum-free, methanol tolerant catalyst for the oxygen reduction reaction (ORR). Dr. Mustain was in the group that first demonstrated and fully characterized the high activity of cobalt-palladium alloy electrocatalysts for the ORR at the PEM cathode. He was awarded the Illinois Institute of Technology (IIT) 2004 Outstanding Teaching Assistant of the Year Award, a Hamid Arastoopour Excellence in Education Award, and a Heald Scholar ('98-02). Dr. Mustain received his Ph.D. in chemical engineering from the Illinois Institute of Technology.



**6. Dr. Tianfeng Lu** is an assistant professor in the Mechanical Engineering department. Dr. Lu received his M.S. degree from Tsinghua University and Ph.D. in mechanical and aerospace engineering from Princeton University. His expertise and research interests are in the computational fluid dynamics and combustion with detailed chemistry as well as reduction of large chemical kinetic mechanisms for computationally efficient simulation of complex multidimensional, turbulent flows and other engineering systems. Applications of his research extend to biofuel combustion, surrogate fuels, carbon sequestration and environmental impacts of energy conversion.